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Investigation of the efficiency of enzyme production technologies using modelling tools

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Growing markets and new innovative applications of industrial enzymes leads to increased interest in efficient production of these products. Most industrial enzymes are currently produced in traditional stirred tank reactors in submerged fed batch culture. The limiting parameter in such processes is often oxygen transfer from the gas to the liquid phase.
In many systems there is a trade-off between productivity and efficiency. Often high productivity technologies and high productivity processes are preferred. We have studied the efficiency of oxygen transfer versus productivity in fed batch fermentations of the filamentous fungus *Trichoderma reesei* in 550litre pilot scale stirred tank reactors for a range of process conditions. Based on the experimental data a process model has been created, which satisfactory simulates the effect of the changing process conditions: Aeration rate, agitation speed and head space pressure. Examples of simulation results and outlines of the future uses of the model will be given.